

TYPHOON WAYNE (12W)

Typhoon Wayne was one of the longest-lived tropical cyclones in the 28-year history of the Joint Typhoon Warning Center (JTWC). Wayne had more warnings (67) issued on it than any other tropical cyclone of 1986. Another unusual fact concerning Typhoon Wayne was that it never fully emerged from the monsoon trough. Due to its highly atypical track, Wayne caused significant forecasting problems for JTWC.

Wayne was a small system that remained in the northern South China Sea and the western Philippine Sea throughout its entire life. Its best track includes three loops and a figure eight. To further complicate matters, Wayne also dissipated and then regenerated while still over tropical waters.

During the middle of August, the monsoon trough was well established in the western North Pacific and the South China Sea. Between 15 and 20 degrees North Latitude, it extended from central Vietnam eastward to Wake Island. Stronger than normal low-level westerlies equatorward of the trough axis were

characteristic of the monsoon trough throughout the month of August and into early September. North of the monsoon trough, the subtropical ridge was also well established.

On August 15th, a small area of persistent convection moved westward across the island of Luzon into the South China Sea. Synoptic data at 150000Z and 151200Z indicated a surface circulation with 20 kt (10 m/sec) winds and a minimum sea-level pressure (MSLP) of 1002 mb. These data prompted JTWC to reissue the Significant Tropical Weather Advisory (ABPW PGIW) at 152100Z. Over the next two to three days, the disturbance moved southwestward and increased in organization. Three Tropical Cyclone Formation Alerts (TCFAs) were issued at 0400Z on the 16th, 17th and 18th of August to advise customers of the good potential for development of a significant tropical cyclone in the area.

After receiving aircraft reconnaissance reports of 40 kt (21 m/sec) and a MSLP of 985 mb at 180724Z (Figure 3-12-1), the first warning was issued on

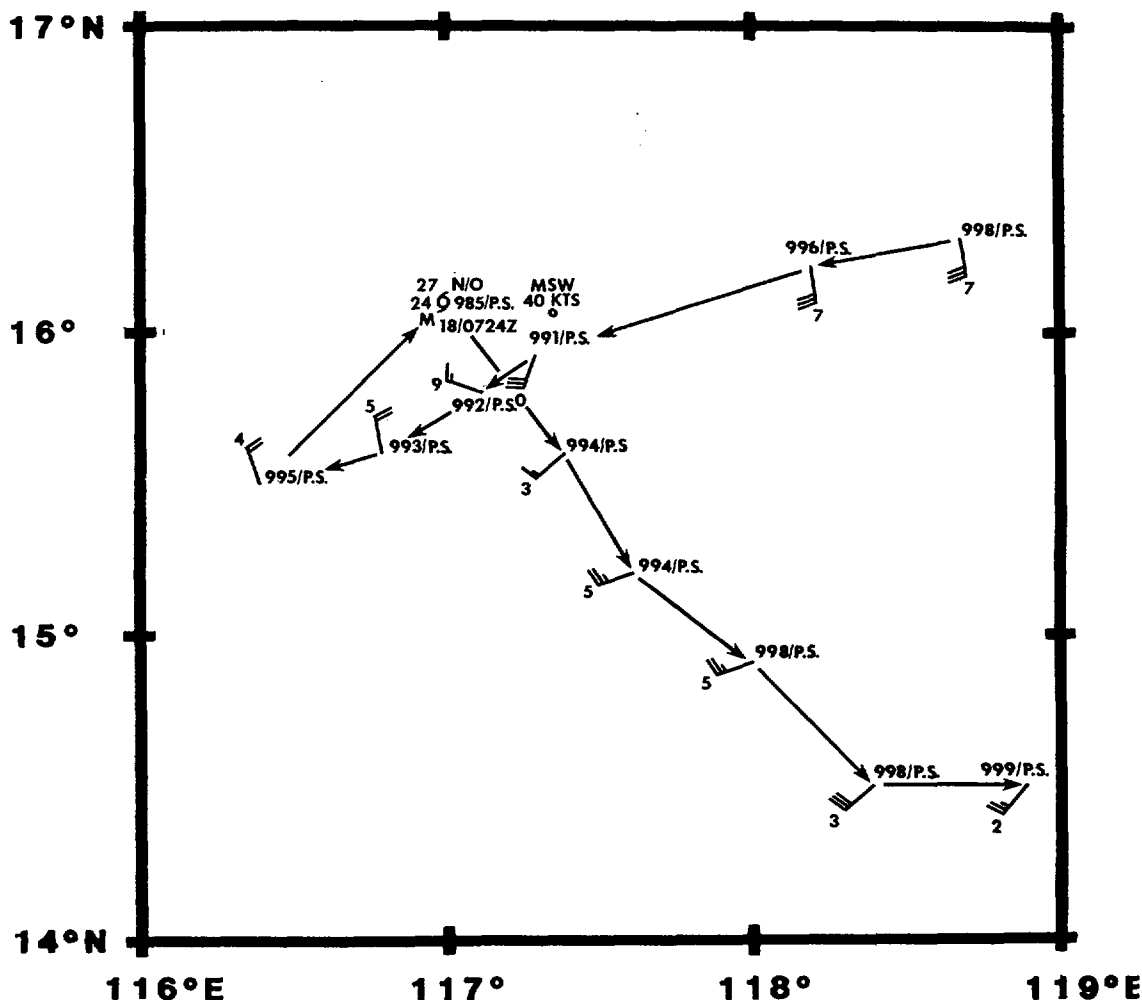


Figure 3-12-1. Aircraft reconnaissance investigative mission located maximum surface winds of 40 kt (21 m/sec) and a minimum sea-level pressure of 985 mb at 180724Z.

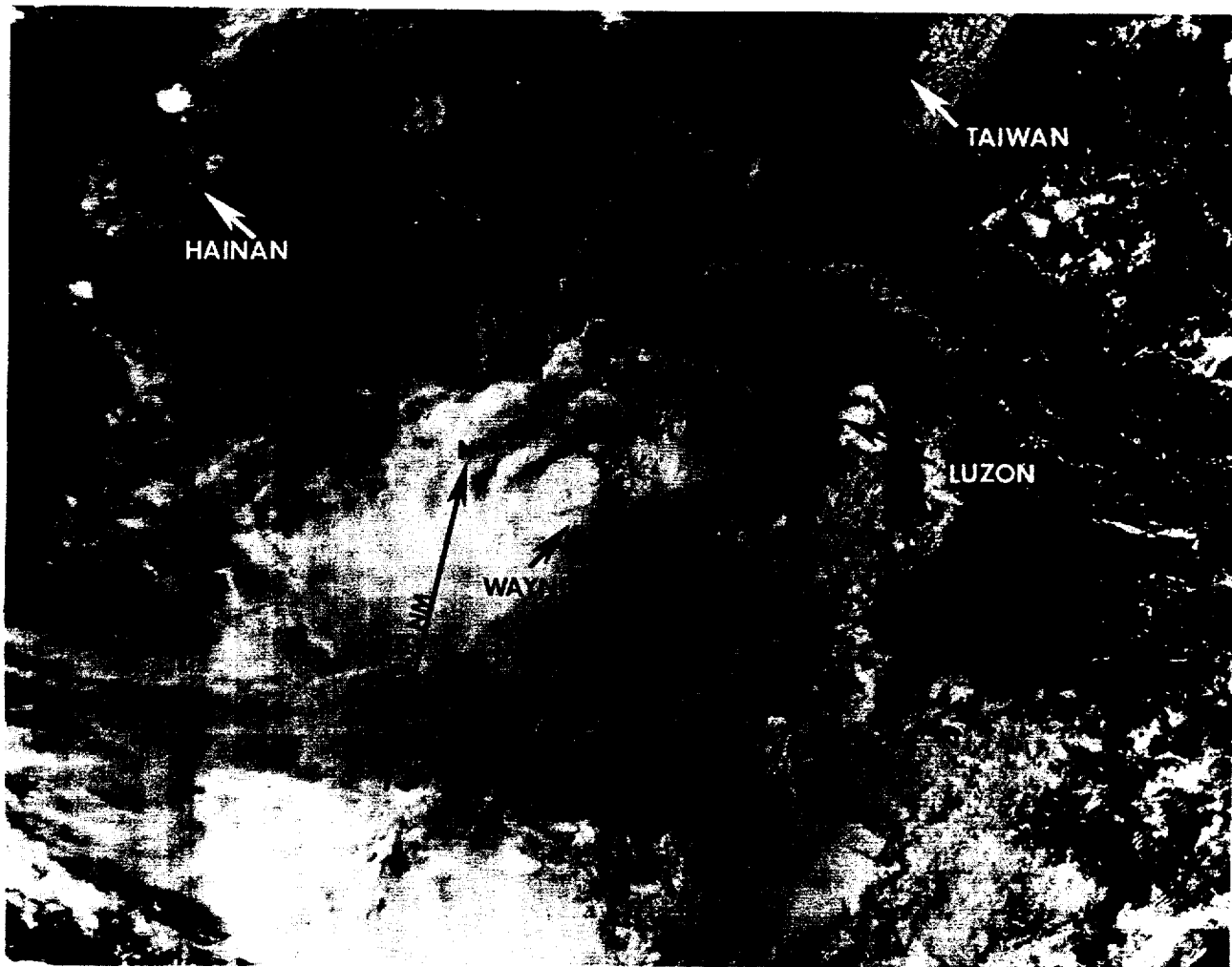


Figure 3-12-2. Wayne shortly before the aircraft reconnaissance mission (Figure 3-12-1) and first warning (180628Z August NOAA visual imagery).

Tropical Storm Wayne (Figure 3-12-2) valid at 180600Z.

Over the next two days, the synoptic scale monsoon trough shifted to the north about five degrees. Wayne responded by moving northwestward also. Throughout this period of position readjustment, gradual development brought Wayne to typhoon intensity at 190600Z. Meanwhile, a weak

mid-latitude trough began to deepen and move eastward across mainland China toward the East China Sea. At 200000Z, this trough, and associated front, extended across the Yellow Sea southward to the southeast coast of China. Also, at 200000Z, Wayne assumed a northeastward track towards Hong Kong and the south coast of mainland China. Hong Kong's radar, at 202104Z (210504H Hong Kong local time) digitally

digitally depicted the rainbands surrounding the eye (Figure 3-12-3) as Wayne passed to the south and east. Another view shows the eye of the typhoon as it was remotely sensed, five-hours later, 450 nm (833 km) from space (Figure 3-12-4). On 22 August, Typhoon Wayne moved northeastward across northern Taiwan and weakened to tropical storm intensity after interacting with Taiwan's rugged mountains. In the meantime, Typhoon Vera (11W) had become the dominant system in the Philippine Sea and began moving rapidly toward the west-northwest. On the 24th, Wayne had moved rapidly west-southwestward and through the Luzon Strait (for the first time) in response to the

northeasterly steering flow associated with the subtropical ridge. As Vera (11W) approached, Wayne decreased significantly in intensity and central convection. Increased vertical shear and subsidence associated with Vera (11W) stripped Wayne of its supporting central convection. As a result, only a small low-level exposed circulation center remained. A final warning on Wayne was issued at 250600Z, but JTWC continued to monitor the disturbance for possible redevelopment.

As Vera (11W) moved northward (261200Z), the remains of Wayne became entrained in Vera's extensive low-level inflow and began to move east-northeastward

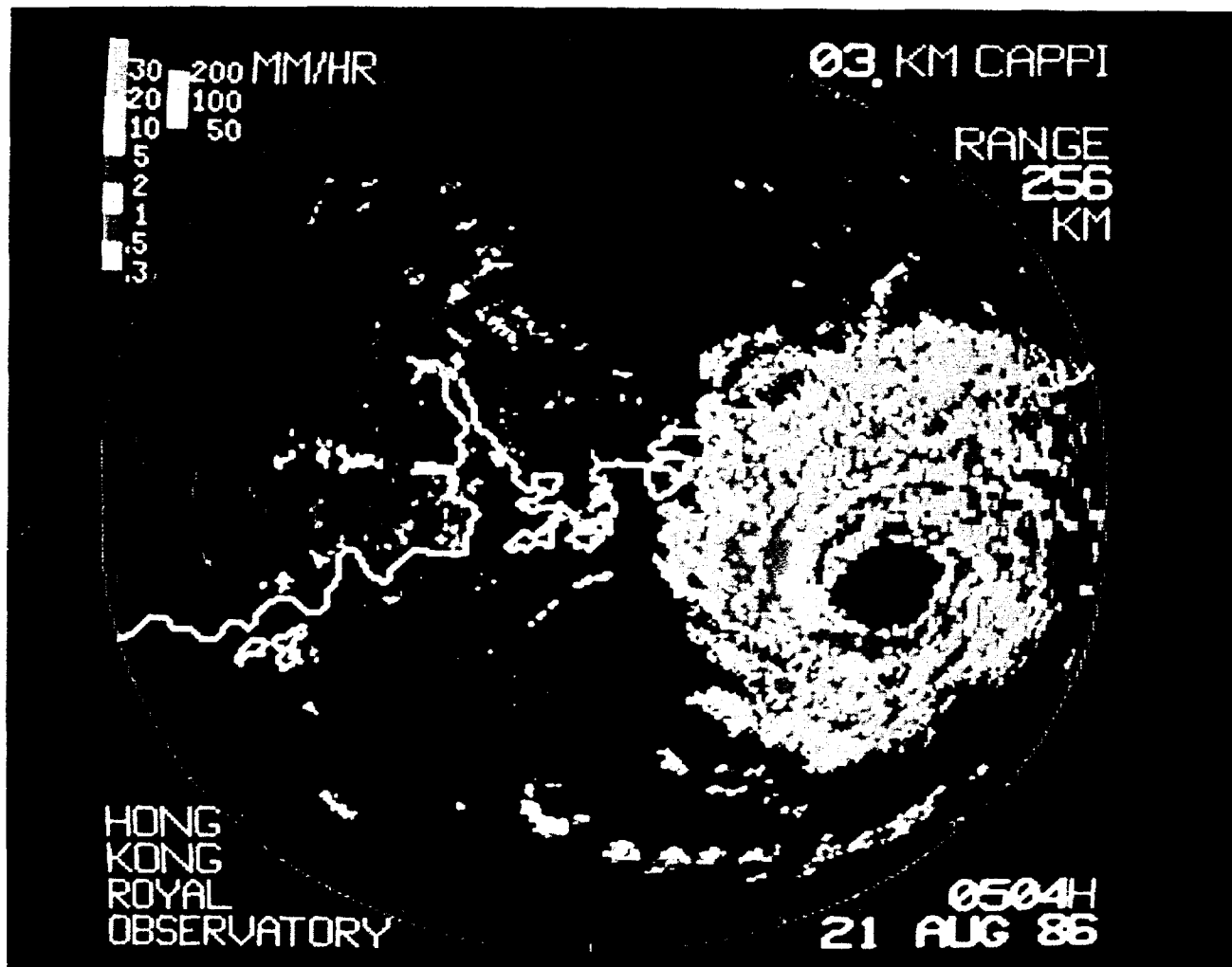


Figure 3-12-3. Digitized radar presentation of Typhoon Wayne at 202104Z (Photograph courtesy of the Hong Kong Royal Observatory).

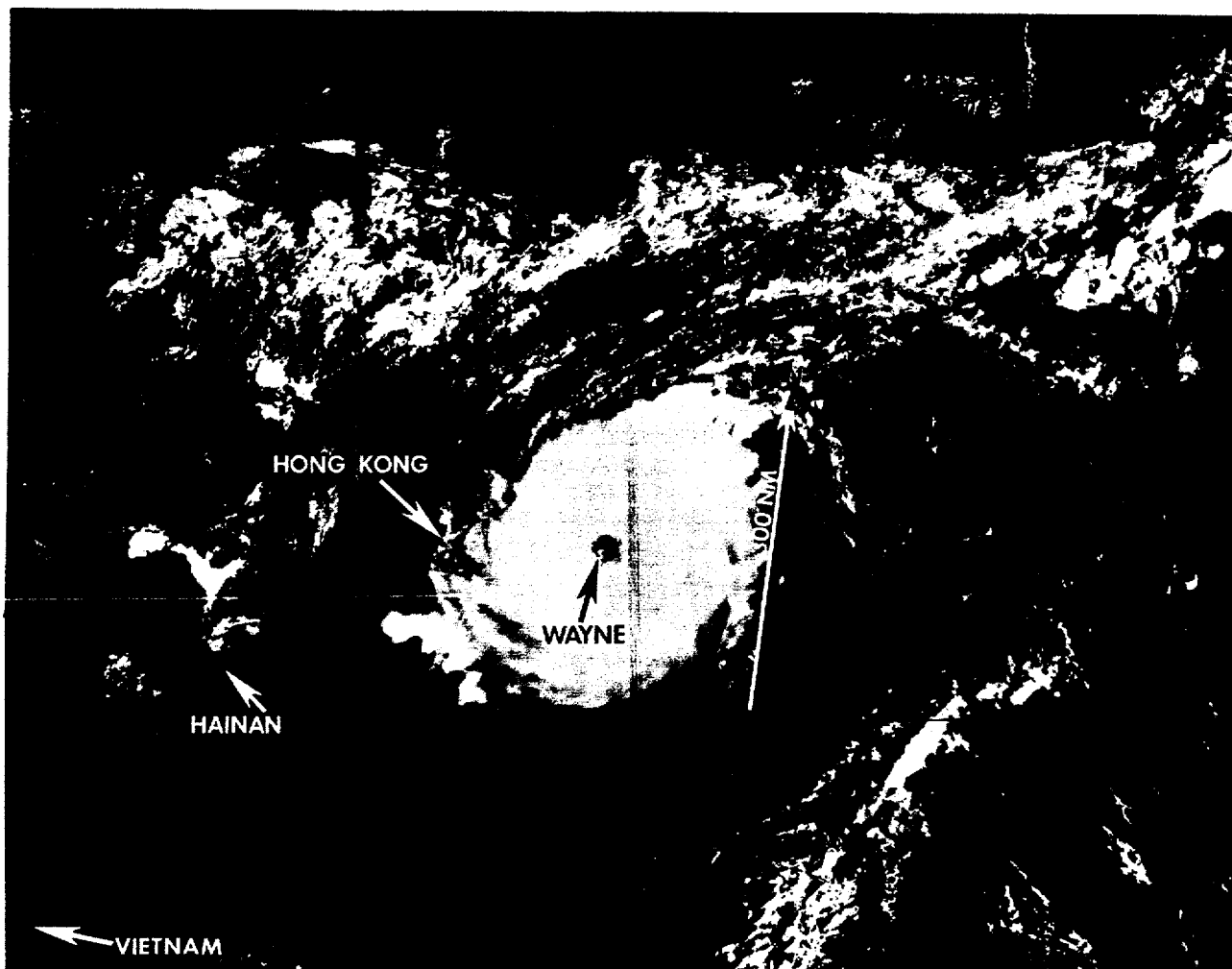


Figure 3-12-4. The eye of Typhoon Wayne. The band of cloudiness associated with the weak front, extending east-west and just to the north of the typhoon (210200Z August DMSP visual imagery).

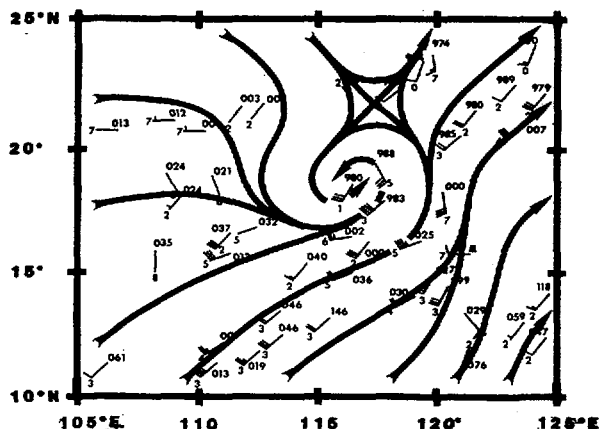


Figure 3-12-5. The 271200Z August 1986 Surface Synoptic Chart. Note the 30 kt (15 m/sec) and 40 kt (21 m/sec) ship reports associated with Wayne.

for the second time. The 271200Z surface analysis (Figure 3-12-5) showed a MSLP of 998 mb, 30 kt (15 m/sec) ship reports, and 40 kt (21 m/sec) ship reports - indications that Wayne had regenerated. These synoptic data, coupled with supporting satellite reconnaissance inputs, prompted JTWC to begin issuing warnings again on Tropical Storm Wayne at 280000Z. Wayne headed northeastward through the Luzon Strait for the second time.

By 31 August, low- to mid-level ridging built back across the East China Sea in Vera's (11W) wake. Wayne's movement toward the northeast slowed and changed toward the southwest - back through the Luzon Strait on the 2nd of September for the third time! After 301200Z, and until 051800Z, Wayne maintained typhoon intensity (Figure 3-12-6). Once through the strait, the typhoon accelerated westward. As it moved away from Luzon, Wayne reached its peak intensity of 90 kt (46 m/sec) at 040000Z. Wayne then moved south of Hong Kong, north of the island of Hainan and across the northern Gulf of Tonkin before dissipating over land over southern China. JTWC issued its final warning at 060600Z.

As a result of Typhoon Wayne, 52 people were reported killed and 97 people were reported injured in Taiwan. On Luzon, 19 people were reported killed and hundreds of people were reported injured. In Vietnam, dozens of people were reported killed in addition to the hundreds reported injured. In total, tens of thousands of people were left homeless and millions of dollars worth of damages were sustained to crops and property due to torrential rain induced flooding and high winds. In summary, Wayne was an extremely long-lived, complex, difficult to forecast "midget" typhoon that struck Taiwan twice, transited the Luzon Strait three times, caused extensive damage and loss of life, and proved to be one for the record books.



Figure 3-12-6. Wayne at typhoon intensity southeast of Taiwan as seen by the Hualien radar (WMO 46699) at 301200Z August (Photograph courtesy of the Central Weather Bureau, Taipei, Taiwan).